WHAT IS CLAIMED IS:

1. A method of generating a synthetic aperture radar (SAR) image from a SAR signal, the SAR signal being indicative of a scene having a multitude of point scatterers and distributed area scatterers, the method comprising:

performing a first partial data stabilization to a point operation on the SAR signal to generate a partially stabilized SAR signal;

performing an along-track migration operation on the partially stabilized SAR signal to migrate SAR signal support of the scatterer in the scene as a function of along-track location of the scatterer in the scene in order to generate an along-track aligned partially stabilized SAR signal;

performing a second partial data stabilization to a point operation on the along-track aligned partially stabilized SAR signal in order to complete the performance of the data stabilization to a point operation on the SAR signal and thereby generate an azimuth formatted SAR signal; and

processing the azimuth formatted SAR signal to generate the SAR image.

2. The method of claim 1 wherein the step of performing the first partial data stabilization to a point operation comprises:

using on the SAR signal a first two-dimensional phase multiplier in order to generate the partially stabilized SAR signal.

3. The method of claim 2 wherein the step of performing the along-track migration operation comprises:

using on the partially stabilized SAR signal an azimuth fast Fourier transformation (FFT), a second two-dimensional phase multiplier, and an inverse azimuth FFT in order to generate the along-track aligned partially stabilized SAR signal.

4. The method of claim 3 wherein the step of performing the second partial data stabilization operation comprises:

using on the along-track aligned partially stabilized SAR signal a third two-dimensional phase multiplier in order to generate the azimuth formatted SAR signal.

5. The method of claim 1 wherein the SAR signal has an azimuth chirp associated with a center transmitter frequency, wherein the step of performing the first partial data stabilization to a point operation on the SAR signal comprises:

removing the azimuth chirp associated with the center transmitter frequency of the SAR signal to generate the partially stabilized SAR signal.

6. The method of claim 1 wherein the SAR signal includes a plurality of pulses each having an azimuth chirp associated with a center transmitter frequency and each having a fast-time frequency, wherein the step of performing the first partial data stabilization to a point operation on the SAR signal comprises:

performing a pulse-by-pulse phase shift without affecting the fast-time frequency of the pulses of the SAR signal in order to remove from the pulses of the SAR signal the azimuth chirp associated with the center transmitter frequency.

7. The method of claim 1 wherein the SAR signal has an azimuth chirp associated with a center transmitter frequency, the azimuth chirp having a quadratic component and a non-quadratic component, wherein the step of performing the first partial data stabilization to a point operation on the SAR signal comprises:

removing the quadratic component of the azimuth chirp associated with the center transmitter frequency of the SAR signal to generate the partially stabilized SAR signal.

8. The method of claim 1 wherein the SAR signal includes a plurality of pulses each having an azimuth chirp associated with a center transmitter frequency, the azimuth chirp having a quadratic component and a non-quadratic component, each pulse having a fast-time frequency, wherein the step of performing the first partial data stabilization to a point operation on the SAR signal comprises:

performing a pulse-by-pulse phase shift and adjusting the fast-time frequency of the pulses of the SAR signal in order to remove from the pulses of the SAR signal the quadratic component of the azimuth chirp associated with the center transmitter frequency.

9. The method of claim 1 wherein the step of performing the along-track migration operation on the partially stabilized SAR signal to migrate SAR signal support of the scatterer in the scene as a function of along-track location of the scatterer in the scene in order to generate an along-track aligned partially stabilized SAR signal comprises:

performing an azimuth Fourier transform of the partially stabilized SAR signal to reach a nominal azimuth image domain of the partially stabilized SAR signal;

multiplying the nominal azimuth image domain of the partially stabilized SAR signal by an azimuth quadratic phase function; and

performing an azimuth inverse Fourier transform of the nominal azimuth image domain of the partially stabilized SAR signal in order to migrate SAR signal support of the scatterer in the scene as a function of along-track location of the scatterer in the scene to generate the along-track aligned partially stabilized SAR signal.

10. The method of claim 1 wherein:

the first partial data stabilization to a point operation is a slow-time data stabilization component of the data stabilization to a point operation.

11. The method of claim 10 wherein:

the second partial data stabilization to a point operation is a fast-time data stabilization component of the data stabilization to a point operation.

12. The method of claim 1 wherein:

the SAR signal is a spotlight SAR signal.

13. The method of claim 1 wherein:
the SAR signal is a strip map SAR signal.

14. The method of claim 1 wherein:
the SAR signal is a scan mode SAR signal.

15. The method of claim 1 wherein the step of processing the azimuth formatted SAR signal to generate the SAR image comprises:
performing a range interpolation operation on the azimuth formatted SAR signal to generate an azimuth and range formatted SAR signal; and
performing on the azimuth and range formatted SAR signal an azimuth and range fast Fourier transform in order to generate the SAR image.

16. The method of claim 15 wherein:
the range interpolation operation includes a Stolt interpolation operation.

17. The method of claim 15 further comprising:
performing an azimuth scaling operation on the azimuth formatted SAR signal prior to the performance of the range interpolation operation.

18. The method of claim 1 wherein the step of processing the azimuth formatted SAR signal to generate the SAR image comprises:
performing on the azimuth formatted SAR signal, in order, a range fast Fourier transform, a two-dimensional phase multiply, and an azimuth fast Fourier transform in order to generate the SAR image.

19. The method of claim 1 wherein the step of processing the azimuth formatted SAR signal to generate the SAR image comprises:
performing a polar format algorithm range interpolation operation on the azimuth formatted SAR signal in order to generate the SAR image.

20. The method of claim 1 wherein the step of processing the azimuth formatted SAR signal to generate the SAR image comprises:

performing a Stolt interpolation and an azimuth and range fast Fourier transform on the azimuth formatted SAR signal in order to generate the SAR image.

21. A method of generating a synthetic aperture radar (SAR) image from a SAR signal, the method comprising:

performing a first partial data stabilization to a point operation on the SAR signal to generate a partially stabilized SAR signal;

performing an along-track migration operation on the partially stabilized SAR signal to generate an along-track aligned partially stabilized SAR signal;

performing a second partial data stabilization to a point operation on the along-track aligned partially stabilized SAR signal in order to complete the performance of the data stabilization to a point operation on the SAR signal and thereby generate an azimuth formatted SAR signal; and

processing the azimuth formatted SAR signal to generate the SAR image.